ENERGY IN THE AIR:
Wind Power Meets the Clean Air Act

by

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Air Quality & Renewables: A Common Fate

- Electric Power Generation = dominant cause:
  - Public Health damage - Particulate and Ozone
  - Acid rain
  - Urban Smog
  - Climate Change
  - Haze in Parks
  - Toxic Metal Emissions
- Renewables could help attain air quality goals and lower compliance costs.
- Clean Air Act Amendments can help or hurt renewable energy industries

Current Linkages: Air Quality & Energy Policies

- Public Attention is focused on Environment & Energy
  - Strong Support for both tighter air pollution controls and more renewables
- Uncertainty in Air Pollution Policy Hinders Planning In Electric Supply Sector
- Energy Policies determine Air quality
- Clean Air Policies Affect Energy Supply
- Congress Considering Energy and Air Quality Bills Simultaneously
  - but often Separately

Bush Energy Plan

- **Emphasis on Coal, Oil and Nuclear**
  - **can't help short-term supply and price problems in electric sector**
- **Endorses CAA Amendments ("3P")**
  - **but abandons earlier promise to control energy sector Greenhouse gas emissions**
  - **Ignores utility industry interest in 4 pollutant control certainty**
- **Suggests Air Pollution Enforcement and Permitting hinder Energy Supply**
  - **Wrong on the facts & bad on the politics**
- **Fails to link Air Quality goals with renewable energy development**
  - **Self-defeating to Supply Objective**

Revised Bush Energy Plan

- Come Back to Carbon
- Modernize pollution controls - end “grandfathering” of old dirty fossil generation
- Improve Market-based Emission Trading Systems - Allow Renewables a Fair Chance to Compete in Markets for Air Quality Improvement
- Recommit R&D funding & continue procurement of Renewables

Clean Air Act & The Wind Industry

- Get ready for the “next” Clean Air Act
- Emission Cap & Trade Systems will be the dominant regulatory mechanism.
- Emission Trading can be modified to create new revenues for wind energy
- Emission Trading (done wrong) can hurt

Planning for Renewable Energy Role in Clean Air Regulation is Underway

- **EPA & Senate are drafting legislation**
- **Federal and state agencies are experimenting with integration of renewables into CAA controls**
- **Potential for a new Revenue Stream - justifies pursuit of policy changes**

Recent Reports

- **REPP Report (Feb. 2000)** www.repp.org
- **NREL Paper** www.nrel.gov/docs/fy01osti/29448.pdf
- **EPA Guidance Doc. - NO_x Set-Asides**
- **Draft NWCC Paper on Renewable Energy Credits**
- **Draft Western Region Air Partnership**
- **CRS Green Credit Whitepaper**

- **Summarize existing CAA programs that directly or indirectly promote renewable energy**
- **Identify specific changes to CAA to boost renewables**
- **Focus on market-based programs (emission trading, allowance set-asides)**

REPP Paper: Wind Energy Financial Benefits from Emission Trading

Avoided Emissions Valuation

C02	$5/T	0.6T/mWh	=	$3.0/mWh
N0x	$2000/T	0.00075T/mWh	=	$1.5/mWh
S02	$200/T	0.006T/mWh	=	$1.2/mWh
		Total	**=**	***$5.7/mWh***

Annual Value
Pollution Allowance Trading
to Renewable Energy Industry in 2010

Industry	*20-MW Facility*	*Entire Industry (in millions)*
Wind	$360,517	$311
Biomass	$587,059	$467
Geothermal	$946,109	$447
Solar	$119,181	$ 46
	Total	**$1,271**

CAA Programs

- Title IV acid rain program – Sulfur dioxide (SO_2)
- Ozone and nitrogen oxide controls (NO_x)
- Visibility, regional haze and particulate matter (PM)
- Climate change and greenhouse gases (GHG) – Carbon dioxide (CO_2)

Title IV Acid Rain Program

- Cap-and-trade program for power plant SO_2 emissions
- Flexible compliance options (install controls, buy allowances, fuel-switch)
- Generally regarded as success – significant and low-cost S02 reductions
- Set aside 60,000 allowances for renewables (CRER)

Acid Rain Program, Con't

- ***S02 cap was not stringent enough to stimulate renewables***
- ***CRER Program Failed to Stimulate renewables:***
  - Participation limited to utilities;
  - Cheaper compliance alternatives available;
  - low rate for awarding allowances (1 per 500 mWh generated)
  - Required least cost planning
  - Expired in 2000

Ozone and NO_x Controls

- 1990 CAA Amendments regulated power plant $N0_x$ to control regional smog transport
- NE States established regional NO_x emission trading program (12 NE states & DC)
- Several NE state programs include NO_x allowance set-asides for Renewables (NY, NJ, Mass)
- NO_x SIP Call - EPA requires power plant NO_x reductions in 19 states and DC
  - Establishes voluntary emission trading option
  - EPA guidance issued on EE/RE set-aside program and output-based allocation strategy
  - Indiana Renewable/Efficiency Set-Aside

National Park & Grand Canyon Visibility Programs

- EPA Regional haze rule:
  - Emission trading may be used instead of Best Available Retrofit Technology for old power plants
  - Awaiting EPA guidance on trading program
  - States in GCVTR can use emission trading instead of basic regional haze rule
  - GCVTR established renewable energy goals (10% regional power needs by 2005 and 20% by 2015)

Greenhouse Gases

- No Effective Domestic C02 regulation
  - Current CAA programs limited to CO_2 emission monitoring and voluntary reduction programs
- National CO_2 limits set for developed countries under Kyoto Agreement
- Agreement encourages development of renewables but includes no mandates
- International negotiations just completed on trading, clean development mechanism (CDM) and joint implementation

American Wind Energy Association

Greenhouse Gases, Con't

- Emerging Utility/Enviro consensus favoring 4-Pollutant bill (S02, N0x, Hg C02)
- ***Candidate*** Bush Promised C02 controls: "4-Pollutant" Power plant cleanup
- ***President*** Bush ***drops*** C02 commitment
- ***Administration*** Promises to revisit C02
- Senate and House 4-Pollutant bills
- "Early reduction" bills as "foot in the door" opportunity
- Emission trading likely to emerge
- Renewables ***may or may not*** be eligible

CAA Recommendations

- Tighten the existing SO_2 cap and establish an improved renewable allowance set-aside program to replace the CRER
- Mandate allowance set aside for renewables in regional or national $N0_x$ cap-and-trade programs
- Include renewables in emission trading to implement national park haze programs
- Come back to Carbon: Include renewables in emission trading programs developed to implement national or international Greenhouse gas controls
- Adopt multi-pollutant allowance award system for renewables

Consequences of Getting it Wrong

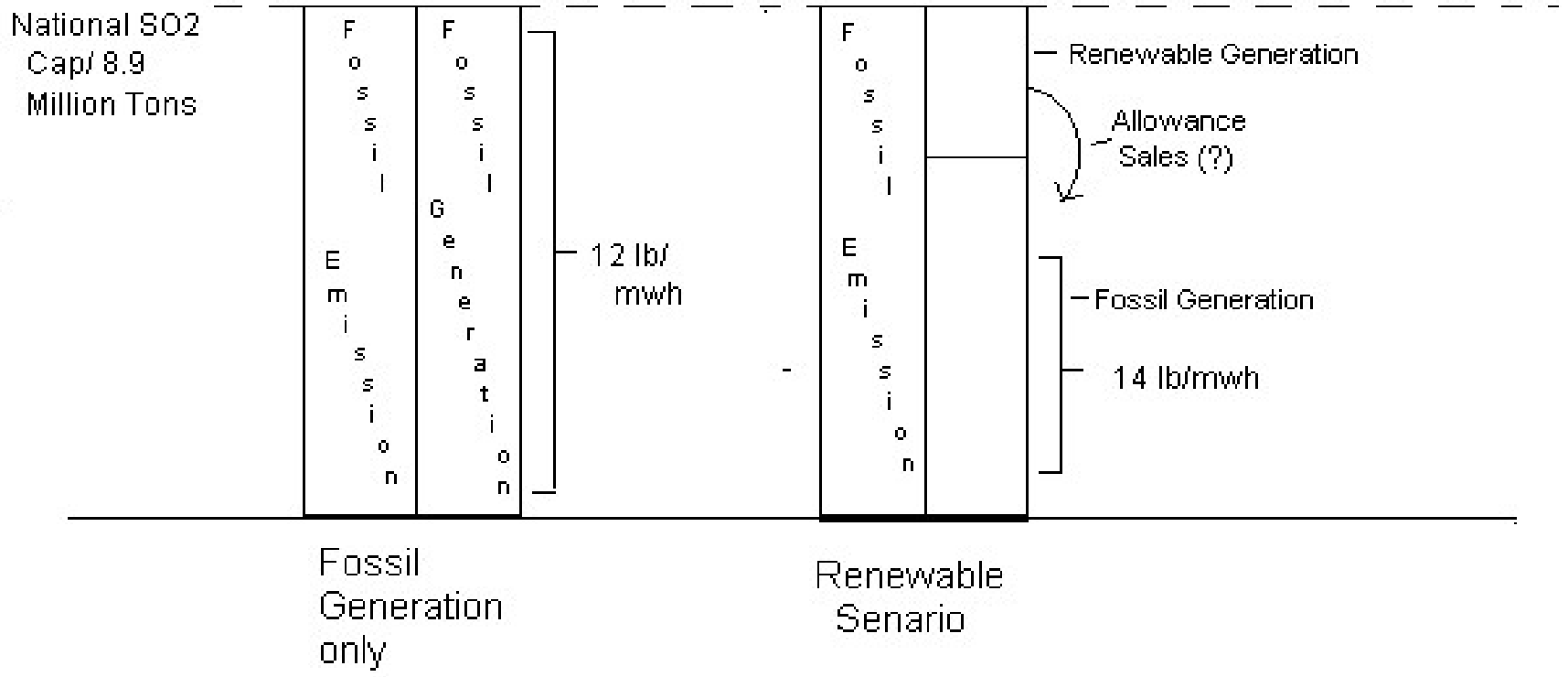
Green Pricing is in Jeopardy:

- **Under a Cap & Trade new renewables do not reduce emissions *unless* generator receives emission credits & retires them or passes them to consumers.**

- **If Cap & Trade systems have no set-aside or allowance allocation for renewables, renewables will loose right to claim environmental values - they are striped of green attributes.**

- **Green Marketing Guidelines would prohibit "dis-aggregation" of environmental values - renewables could loose green market if renewables are left out of any ONE pollutant cap and trade regulation.**

Renewables Don't Reduce Air Pollution Under Simple Emmisson Cap



Consequences of getting it Wrong, Con't

- **Green markets for Renewable Energy may fail,** if cap and trade air quality regulation fail to include Set-Asides or Direct Allocations for renewable energy
- **Fossil generation will enjoy an unfair and perverse advantage in electricity market** if air quality regulation fails to give renewables the economic benefit of their effect on environment and public health

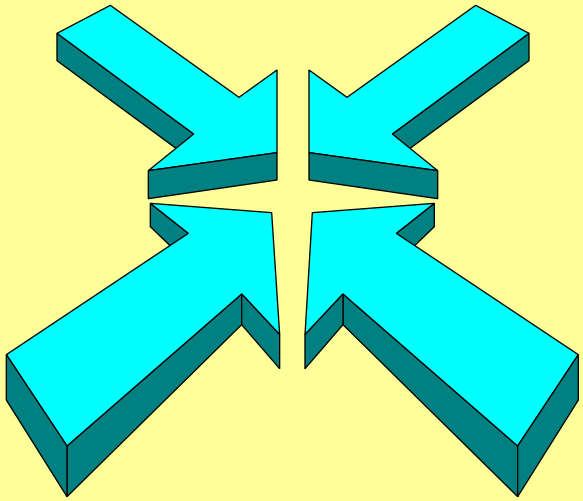
Consequences of getting it Right

- Cleaner Air
- Lower Compliance Costs over long term
- Greater Energy Security - Diversity
- Half-cent+/kWh in revenues
- Narrower cost differential between fossil and renewable generation
- Stronger Green Markets

CLEAN AIR ACT AMENDMENTS - OTHER POTENTIAL HITCHHIKERS

- National Renewable Portfolio Standard
- Federal Government Procurement
- National Net Metering
- Federal Match to State Public Benefit Funds
- Transmission polices (interconnection, imbalance rules, system expansion)
- Small wind turbine Tax Credit

CONCLUSION



- **INTEGRATION OF RENEWABLES INTO THE FABRIC OF CLEAN AIR PROGRAMS IS AN IMPORTANT POLICY OBJECTIVE**

- **WHAT WILL IT TAKE?**
  - **Coordinated Effort By Government, States, Renewable Industries, Green Power Marketers & Citizen Groups To *Popularize And Support* Concept**
  - **Need To Move Quickly: Planning For Next CAA & Many State/regional Programs Is Underway**